



Nepal Country Programme for the Phase Out of Ozone Depleting Substances

Submitted to

**Nepal Bureau of Standards & Metrology
Ministry of Industry
His Majesty's Government of Nepal**

Final Report
Sep. 1998

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COUNTRY PROGRAMME COVER SHEET

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Country : Nepal

Lead National Agency : Nepal Bureau of Standards and Metrology,
Ministry of Industry,
His Majesty's Government of Nepal

Period covered
by Country Programme : 1998-2010

1. Phase Out Schedule

Substances*	Current consumption (ODP-tonnes in 1996)	Planned total consumption till phase out (ODP-tonnes)	Planned year of phase out
CFC-12	29.058	244.027	2010
Total	29.058	244.027	2010

* The HCFC-22 consumption in 1996 was 23 tonnes.

2. Government Action Plan (policy framework)

Year(s)	Description of Action	Sector	Intended effect
1999	Registration of ODS importers	RAC	Regulation of imports
1999	Accreditation of servicing enterprises	RAC	Regulation of consumption, and identification of training needs
1999	Ban on Halon imports	Fire fighting	Control of future imports
1999	Ban of import of CFC-containing equipment	RAC	Minimization of servicing needs
2000-2010	Regulation of ODS imports and sales	RAC	Meet Protocol commitments
2000-2010	Tax on CFCs	RAC	Economic incentive to adopt non-CFC equipment

3. Summary of Projects being submitted with this Country Programme

Year(s)	Type of project	Project description	Project cost	Incremental cost	Participating implementing agencies (if any)	Tonnes x ODP Phased Out
1999-2001	Institutional strengthening	Creation of National Ozone Unit	\$ 77,000	\$ 77,000	UNEP	-
1999	Project preparation	Development of Refrigeration Management Plan	\$ 30,000	\$ 30,000	UNEP	-

4. Summary of projects expected to be submitted later

Year(s)	Type of project	Project description	Project cost	Incremental cost	Participating implementing agencies (if any)	Tonnes x ODP Phased Out
1999-2005	Training	Training of servicemen etc.	\$ 50,000	\$ 50,000	UNEP	-
1999-2005	Training	Training of custom officers	\$ 40,000	\$ 40,000	UNEP	-
1999-2005	Investment	Recovery & recycling facilities	\$ 150,000	\$ 150,000	-	28
1999-2001	Investment	Conversion of commercial refrigeration manufacturing enterprises	\$ 20,000	\$ 20,000	-	1

5. Costs

Costs of Activities and Projects in Country Programme (US \$) : 107,000

Estimated cost of complete phase out (US \$) : 367,000

Estimated cost effectiveness (US \$) : 12,655 per tonne x ODP

Contents

Executive Summary

1. Introduction

1.1	Purpose	1
1.2	Status	1
1.3	Assistance received	2

2. Current Situation

2.1	Consumption of ODS	3
2.1.1	Current consumption	3
2.1.2	Forecast of unconstrained Demand	5
2.2	Industry Structure	7
2.2.1	Importers of ODS	7
2.2.2	Users of ODS	7
2.3	Institutional Framework	8
2.3.1	Lead agency	8
2.3.2	Coordination	8
2.4	Policy Framework	8
2.5	Government and Industry response to the Protocol	9

3. Implementing the phase out

3.1	Strategy statement by the Government	9
3.2	Action plan	10
3.2.1	Government actions	10
3.2.2	Projects	12
3.3	Roles in implementing the strategy	13
3.4	Timetable and consumption implications	13
3.5	Budget and Financing Programme	14
3.6	Monitoring arrangements	15

Annex I Projects

I.1	Institutional Strengthening Project	17
I.2	Refrigeration Management Project	20

Executive Summary

The Government of Nepal ratified the Montreal Protocol on Substances that Deplete the Ozone Layer in 1994, and this Country Programme presents a comprehensive action plan to phase out ODS consumption.

Nepal depends heavily on refrigeration and air conditioning, which are required for key segments of its economy - preservation and transport of food, and tourism. Many refrigeration and air conditioning systems contain CFC-12, which damages the stratospheric ozone layer, and has been classified as a controlled substance under the Montreal Protocol.

Nepal's current consumption of Annex A CFCs is 0.0013 kg per capita, hence, it operates under paragraph 1 of Article 5 of the Protocol and is eligible for assistance from the Multilateral Fund.

A 1996 survey of ODS consumption in Nepal found that 29 tonnes of CFC-12 and 23 tonnes of HCFC-22 were consumed in Nepal during that year. Approximately 1.0 tonnes of CFC-12 is used in new equipment, and the balance 28 tonnes is for servicing (15.8 tonnes for domestic refrigerators and 12.2 tonnes in commercial and industrial refrigeration and air-conditioning).

The Action Plan, contained in the Country Programme, envisages complete phase out of CFC-12 within the timeframe established by the Montreal Protocol. The Action Plan is linked with the broad strategy to be adopted in India for CFC phase out. This is because of the long border shared between the two countries, and a large percentage of CFC imports in Nepal being acquired in India. The Action Plan contains a comprehensive range of measures that will ensure that this target is met.

The main features of the Action Plan are legislative bans and restrictions of CFC and equipment based on CFC. For any phase out Programme to be successful it must be based on a high level of awareness of its objectives, and ownership by the main stakeholders. Therefore, the Action Plan depends on the conduct of a public and industry awareness campaign.

Industry is an important partner for carrying through many elements of the Plan: Through a recovery and recycling system, registration for the purchase of CFC and accreditation to use CFC, the refrigeration service industry will play its part in conserving existing stocks of CFC

by reducing unnecessary emission. Training will be provided to the refrigeration servicing sector to ensure that they have the skills required to effectively maintain and repair equipment with minimum release of CFC to the atmosphere.

An Ozone Unit will be set up to coordinate the phase out activities.

Through this Country Programme, Nepal is requesting financial assistance from the Multilateral Fund to implement an Institutional Strengthening project (US\$ 77,000) and develop a Refrigerant Management Plan (US\$ 30,000).

1. Introduction

1.1 Purpose

Nepal is a landlocked country, bordered by India on the South and China on the North. The terrain is generally mountainous and rugged, ranging in altitude from 1,100 m to over 9,000 m (including the world's highest peak). It covers an area of about 147,181 sq km, and had a population of about 21.5 million in mid-1995, growing at about 2.5% per annum. The bulk of population lives in the relatively lower-lying areas of the south and the west, with less than 25% living in the mountainous North-east.

The economy is dominated by the agricultural sector, which contributed an estimated 55% to the Gross Domestic Product (GDP), and supports three quarters of the population, mainly in rural areas and generates about 80% of export earnings. The industrial sector is small, contributing about 10% to the GDP and absorbing only 1% of the labor force. It is comprised largely of cottage and small-scale industries, with some modern industries in or near the Kathmandu valley. The per capita GNP for 1995 was US\$ 200 and the GNP was US\$ 4.3 billion. Estimated growth rate of the GDP is over 5% per annum.

Tourism is a major growth area, with an average growth rate of about 14%. Tourism makes up for over 20% of the foreign exchange earnings of the country, and about 15% of the GDP.

In the latest development plan the Prime Minister stated that underlying the government's development policies is a commitment to sustainable development. The appreciation of the links of economic development on the environment exists at the highest levels of the government.

Nepal acceded to both the Vienna Convention and the Montreal Protocol in 1994, but has not ratified the 1990 London Amendments. The Government is also party to several other international treaties and conventions to protect the environment.

1.2 Status

The national lead agency responsible for implementing and developing the Country Programme is the National Bureau of Standards and Metrology (NBSM) in the Ministry of Industry, Nepal. A task force within the NBSM has been created to carry out these activities. A National Committee to oversee and guide the Country Programme preparation was constituted with representation from various government ministries and departments, academic institutions and NGOs.

The United Nations Environment Programme, was approached via the OzonAction Programme, to assist Nepal to fulfill its obligations under the Protocol, an in particular to assist in the formulation of the Country Programme.

The National Committee met on twelve occasions, assisted by the consultant on his two missions, collected consumption data, and developed the Action Plan that forms part of this Country Program.

The Country Programme was referred to the Nepal Bureau of Standards & Metrology, Kathmandu in September 1998, and adopted by the government prior to deliver to the Montreal Protocol Secretariat.

1.3 Assistance Received

In preparing the Country Programme financial and technical assistance has been received from the Multilateral Fund through the United Nations Environment Programme, Paris, and the following industry and government bodies in Kathmandu:

Government

Ministry of Industry, HMG/N

NBSM, HMG/N

National Planning Commission

Department of Hydrology & Meteorology

Ministry of Law and Justice, HMG/N

Institute of Engineering

Tribhuvan University

Industry

Nepal Refrigeration and Air Conditioning Maintenance Association

Pashupati Refrigeration

Sigma Refrigeration

Continental Refrigeration

Lama Apex Refrigeration

Hilltake Air-conditioners

Chirag Foam Industries Pvt Ltd

DK Refrigerator Repairs

Manikratna Refrigerator Repairing

Manoj Enterprises

Shesh International

Mahakali Refrigerator & Electrical Workshop

The task force obtained cooperation from the importers of ozone depleting substances, major end-users to collect consumption data, and discussions held with service people provided useful input into the preparation of the Country Programme.

2. Current situation

2.1 Consumption of ODS

2.1.1 Current consumption

Nepal does not manufacture any ozone depleting substances (ODS) controlled under the Protocol, nor does it export ODS. Of the ODS listed in Annex A and Annex B of the Protocol, Nepal only imports a few, and these come mainly from India. The vast bulk of consumption of ODS is for recharging installed equipment. Some ODS is used in charging new commercial refrigeration appliances.

Data for consumption of ODS has been difficult to calculate because a large proportion of ODS are imported directly by dealers and by end users as personal effects and therefore are not recorded separately by the Customs Department. The Customs system for recording imports does not have a specific code for ODS, resulting in ODS being recorded with other chemicals under various codes.

To supplement incomplete Customs data, end users were surveyed by the NBSM. There are a large number of end users, surveying them all have proved to be laborious. Not all are easy to identify, individual end users often do not maintain information of their consumption and the data is therefore likely to be incomplete.

During 1996 the consumption of Annex A CFCs was 29 ODP tonnes, which amounts to a per capita consumption of 0.0013 kg. A detailed breakdown of consumption by substance and by end use is given in Tables 2.1 and 2.2, respectively.

Table 2.1. ODS consumption by substance in Nepal

Substance	Production (tonnes)	Imports (tonnes)	Exports (tonnes)	Consumption (tonnes)	ODP	Consumption (in ODP tonnes)
Annex A, Group 1 CFC-12	0	29.058	0	29.058	1.0	29.058

Note: The consumption of HCFC-22 during 1996 was 23.04 tonnes.

The survey identified CFC-12 and HCFC-22 as the only ODS consumed in Nepal. No reports of CFC-11 use for applications such as foam blowing and flushing were obtained.

Table 2.2. ODS consumption in Nepal - 1996 (Based on the ODS-Consumption Survey)

User Sector	Substance	ODS Consumption (ODP tonnes/year)
Commercial Refrigeration		
New Equipment	CFC-12	0.900
Servicing		
Shops & other commercial establishments	CFC-12	1.438
Dairy	CFC-12	3.006
Beverage manufacturing enterprises	CFC-12	0.146
Building Air Conditioning		
Servicing		
Central Units	CFC-12	7.691
Domestic Refrigerators		
New Equipment	CFC-12	0.060
Servicing	CFC-12	15.817
Total		29.058

The Survey found that ODS consumption in Nepal in 1996 was 29 ODP tonnes of CFC-12 and 23 tonnes of HCFC-22; all in the refrigeration and air conditioning sector. About 1 tonne of CFC-12 is used in new equipment, and the balance 28 tonnes is for servicing (15.8 tonnes for domestic refrigerators and 12.2 tonnes in commercial and industrial refrigeration and air-conditioning).

The structure of the ODS user sector is discussed as follows.

a) Commercial and Industrial Refrigeration

ODS used in this sector are CFC-12 and HFC-22. The major users of ODS in this sector include hotels, large retail outlets, dairy and beverage industries and wholesalers.

ODS consumption in mobile air-conditioning was not included as separate category in the ODS survey because it is felt that this amount is extremely small. It is already included in the commercial refrigeration servicing estimate.

(b) Fire protection

There are no halon flooding systems in Nepal. There are a small number of BCF extinguishers which are not being charged now.

(c) Polyurethane Foam Manufacture

Manufacturing of polyurethane foam does not exist in Nepal. There are five foam manufacturers; all of whom use isocyanate foaming process. Glasswool is used for insulation in refrigeration equipment manufactured in the country.

(d) Solvent Cleaning

There is no ODS based solvent cleaning industry, but small quantities of ODS may be used to clean electrical equipment, such as videos and computers. This is not expected to be more than a few kilograms a year.

(e) Aerosols

There is no manufacturer of aerosol products. Import of aerosol products is not banned as yet, but a survey of retail outlets indicated that none contain CFC propellants.

(f) Methyl Bromide

It is reported that no methyl bromide is used in the country.

(g) Hydrochlorofluorocarbons

The only HCFC used in significant quantities is HCFC-22, which is mainly used in domestic air conditioning and in commercial refrigeration. Its use in 1996 is estimated to be 23 tonnes, which is expected to increase substantially as many refrigeration and air conditioning applications that currently use CFC-12 are converted to HCFC-22. The demand for HCFC-22 will mainly be in the area of commercial refrigeration and air conditioning.

2.1.2 Forecast of unconstrained demand

Growth trends in commercial refrigeration are felt to be most rapid in servicing of cold rooms, display cabinets, bottle coolers and other shop-based refrigeration equipment; growing at about 20 to 30% per year from the current base of about 1.4 tons. The growth of new equipment manufacture in this sector is comparatively slower at about 5 to 10% per year; the majority of new equipment being imported. CFC consumption in commercial refrigeration servicing is also rising in the dairy sector; the rate of growth is probably the same as that of the dairy industry (10% per annum).

No new CFC-based air-conditioning equipment are being installed; this has been almost completely replaced by HCFC-22 systems. Consequently, servicing demand in the building air-conditioning sector is not expected to increase.

There is considerable debate on the servicing needs of domestic refrigerators. It is estimated that about 25,000 refrigerators are imported into Nepal every year, representing a growth rate of 15 to 20% per annum. However, as servicing needs of domestic refrigerators can exhibit a considerable time-lag after initial procurement, the current growth rate maybe slower (5 to 10% per annum), expected to increase to 15 to 20 % per annum beyond 2005.

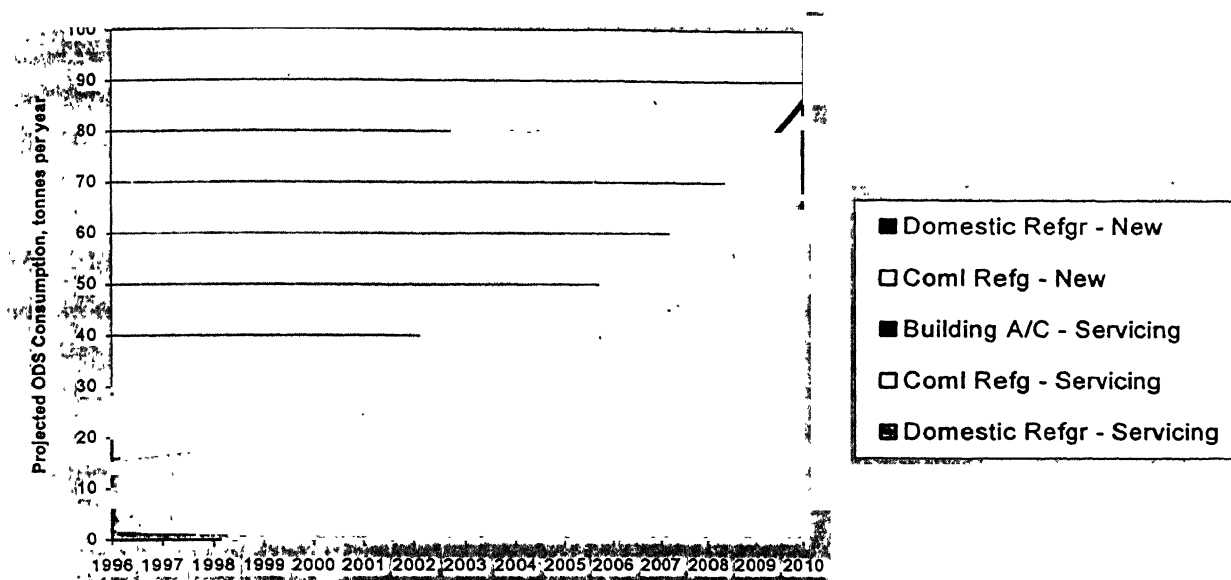


Figure 2.1 Projected ODS consumption

Unconstrained Growth Estimate

Based on the assumptions provided above, the expected unconstrained growth is shown in Table 2.3 for the years 2000, 2005 and 2010. Figure 2.1 shows the projected trend till 2010 in each of the major user categories.

Table 2.3. Unconstrained consumption of ODS (in kgs)

	1996	2000	2005	2010
Commercial Refrigeration	5490	7368	10836	16213
New Equipment	900	1202	1726	2477
Servicing	4590	6166	9110	13736
Commercial	1438	1587	1796	2032
Dairy	3006	4401	7088	11415
Beverage	146	177	226	289
Building Air conditioning	7691	7691	3413	1514
Servicing-Central Units	7691	7691	3413	1514
Domestic Refrigerators	15877	21189	30400	68004
New Equipment	60	66	75	85
Servicing	15817	21123	30325	67919
Total	29058	36248	44648	85731

The significance of domestic refrigerator servicing needs in the projected forecast comes out of the current boom in refrigerator imports and sales. Commercial refrigeration servicing is in the other major user sector that would contribute to ODS use in Nepal. All the other user sectors contribute less than 10% to the total consumption.

2.2 Industry Structure

2.2.1 Importers of ODS

Nepal does not manufacture any ODS, and imports all its requirements. There are three importers of ODS into Nepal; the most important being Pashupati Refrigeration who is the dealer for the largest Indian CFC manufacturer. The other importers procure CFCs on an occasional basis from other Indian manufacturers and sometimes from dealers in Singapore. In addition, a number of end users import their own supplies.

2.2.2 Users of ODS

A detailed breakdown, based on industry sector for annual consumption is given in Table 2.2. There are a large number of refrigeration servicing enterprises that procure ODS from the importers.

There are four manufacturers of refrigeration and air conditioning equipment. These are Prabish Technology Co., Weather Maker, Hilltake Air Conditioner (all of whom are involved in the manufacture of commercial refrigeration equipment) and Chitwan Refrigerator Plant (which manufactures about 200 domestic refrigerators a year). The CFC consumption in the manufacture of new commercial refrigeration equipment is about 0.9 tonnes of CFC-12, and that in domestic refrigeration is 0.06 tonnes. These enterprises have already shifted from the use of CFC-12 to HCFC-22 in the air conditioning sector. They do not have regular production schedules, and manufacture new equipment as orders come in.

The servicing enterprises maintain and recharge equipment in the dairy and beverage industry, commercial buildings and refrigeration equipment in shops and outlets.

The Nepal Refrigeration and Air Conditioning Maintenance Association represents about three quarters of the people servicing ODS-based equipment. Most service companies are very small, staffed with one or two people, and are mainly based in Kathmandu and Pokhara. About 80% of the servicing demand is in the Kathmandu region. There are over 100 servicing enterprises, and the number of technicians is estimated to be about 500.

There are no formal qualifications required to service refrigeration equipment or air conditioners, although about half of the service people do have an relevant technical education, mainly from the courses organized by the Institute of Engineering.

2.3 Institutional framework

2.3.1 Lead agency

The Government has given the Ministry of Industry the responsibility for formulating the Country Programme and with its implementation, once adopted.

The Nepal Bureau of Standards & Metrology will do administration of this Programme. An Ozone Unit in NBSM will coordinate the Country Programme implementation, formulate and develop appropriate legislation, report to the Montreal Protocol Secretariat (as stipulated in the Country Programme) and participate in public and industry awareness campaigns.

2.3.2 Coordination

A steering committee, to be called National Ozone Committee will be established to provide a coordinating role, bringing together the parties involved in the implementation of the Country Programme. It will also include representatives from key government agencies responsible for aspects of the phase out, consumers and the refrigeration service organization and the Nepal Refrigeration and Air Conditioning Maintenance Association.

2.4 Policy framework

The existing policy framework on which an Action Plan will be based is the Industrial Pollution Control Regulations. This is implemented by the Ministry of Industry, and allows the Ministry to control, regulate and monitor industrial activities that may lead to pollution.

The Ministry will, on the recommendation of the Ozone Unit, develop and notify procedures for the reporting of CFC imports and sales, and for controls on imports and sales. Customs duties and excise tax on CFC may also be increased in order to provide an economic signal to promote phase out.

2.5 Government and Industry responses to the Protocol

His Majesty's Government of Nepal signed the Montreal Protocol in 1994, and ratified it in 1996. A Gazette notification of the ratification was issued in 1996, a National Committee for Country Programme preparation was created. The Nepal Bureau of Standards and Metrology (NBSM) in the Ministry of Industry has been designated as the Lead Agency for ODS phase out.

The government requested Multilateral Fund support for Country Programme preparation. The NBSM, in consultation with the international consultant for Country Programme preparation, carried out a survey of ODS consumption, and prepared the Country Programme for ODS phase out. The NBSM has also initiated awareness and publicity campaigns through meetings and published material. Ozone Day is organized to create awareness and sensitize the public through meetings and media (newspaper and TV) reports.

3. Implementing the phase out

3.1 Strategy statement by the government

Nepal is a Party to the Montreal Protocol, operating under paragraph 1 of Article 5, hence is required to phase out the consumption of CFC by the year 2010. The Government is committed to its obligations under the Montreal Protocol, and will ensure that the consumption of CFC would be reduced to zero by the year 2010.

The policy framework within which the phase out of CFC will be managed is based on four tenets: Government restrictions on imports; industry initiated support for new systems; training of service people on new systems and refrigerants; and cooperation between government and importers to conduct an awareness campaign with the public and industry.

The strategic objectives on which this Action Plan is based are:

1. Compliance with the Protocol limits on consumption and phase out use of CFC as soon as economically possible
2. Development of regulatory instruments within the existing legal framework
3. Maintaining supply of CFC for existing equipment until satisfactory new systems have been commissioned and substitutes are readily available
4. Minimum economic cost to the country
5. Continuing consistency with industry development policies
6. Promoting and encouraging compliance through raised public and industry awareness
7. Development of local expertise in CFC-alternative technology
8. Involving stakeholders in the implementation of the Action Plan
9. Coordinating phase out activities with the Government of India

While the national consumption is low, it should be noted that unconstrained growth will result in a three-fold increase in CFC consumption by the year 2010. To achieve the phase out timetable, the Government has based its action Programme on the following elements:

- *Restrictions and Import Bans* - of CFC and CFC-based equipment and products.
- *Higher (import and excise taxes) for CFC* – to provide an economic signal to the market to preferentially adopt non-CFC chemicals and equipment.
- *Institutional Strengthening* - will ensure that the implementation of the country Programme will be coordinated and will be directly responsible for aspects of implementation.
- *Public and Industry Awareness* - will ensure support of the Country Programme and cooperation of the Action Plan, and will be targeted at the public and industry, so that they are informed as to the implications of the Country Programme, and their role in ensuring the success of the Action Plan.

- *Strategic Planning* - to ensure that all the technical and practical issues in changing over commercial and industrial refrigeration and air conditioning systems are identified and that a plan on how to address these issues is developed, together with a plan to manage the supply of the post phase out 'tail'.
- *Training and Information Exchange* - is important to ensure that the local industry can install and service new systems that use CFC alternative gases.
- *Registration and Accreditation* - will ensure that CFC can only be purchased and used by service people who have been able to demonstrate that they are able to minimize avoidable emission of CFC to the environment.

The action Programme will be implemented cooperatively between the government, NGOs and industry, with the support of the general public.

3.2 Action Plan

3.2.1 Government actions

A series of government actions will regulate the import, sales and servicing of CFC and CFC-containing equipment. These actions are based on the imperative to reduce the short-term demand for domestic refrigerator servicing, and enable a CFC recovery and recycling system to become operational in the medium term. The timing is adjusted to ensure that there are no adverse impacts of the Indian phase out schedule on the Nepal phase out strategy. Table 3.1 highlights the major government actions and their timing.

Table 3.1 Government actions for CFC phase out

Sl. No.	Action	Timeframe
1.	Registration of importers of CFC	By January, 1999
2.	Accreditation of servicing enterprises	January – June 1999
3.	Ban on import of halons	January 1999
4.	Ban on import of CFC-containing equipment	June 1999
5.	Recovery and recycling of CFCs from large systems	From June 1999
6.	Control on CFC imports and sales	January 2000 – December 2009
7.	Taxation on CFCs	January 2000 – December 2009
8.	Recovery and recycling for all systems	From January 2003

(a) Ban of products containing ODS

An order to ban the importation of halons, other than those used on airplanes and ships, and aerosols containing CFC, other than asthma sprays.

(b) Prohibition on equipment

The largest consumption of CFC in Nepal is (and will continue to be) in the servicing of domestic refrigeration. It is important that controls and bans are put in place on importation of domestic refrigerators that are not capable of being converted to alternative refrigerants to CFC. If this is not done then supplying the post phase out 'tail' will become more difficult.

An order will be made to prohibit the importation of new and second hand equipment and appliances that are designed to use CFC, and new vehicles that have air conditioners that use CFC-12.

(c) Control on ODS imports

Since Nepal does not produce any ODS, the control of imports is equivalent to controlling consumption. ODS imports will be controlled so that Montreal Protocol requirements are met on the one hand, and an adequate supply for servicing is maintained.

(d) Code of Practices

The Institute of Engineering, along with the Refrigeration and Air Conditioning Maintenance Association, will develop a code of practice for servicing refrigeration and air conditioning systems.

(e) Registration and Accreditation

A registration systems will be developed to restrict those companies and individuals allowed to import CFC in Nepal and an accreditation of service people who can use CFC. One of the conditions of registration is that sales can only be made to accredited service people. Service people will be required to demonstrate an adequate level of knowledge and expertise to comply with the Nepal Refrigeration Code of Practice and undertake training at the Institute of Engineering in the course they are developing for this purpose.

(f) Monitoring Imports

To monitor imports of ODS the Custom's codes will be amended to permit substances in Annex A and B of the Montreal Protocol to be identified. Consumption of ODS, by application, will be obtained from registered users and accredited service people and reconciled against Custom's records.

(g) Technical Clearing House

The Nepal Institute of Engineering and Ozone Unit will provide facilities for service people to access information on technical issues. This will assist them to overcome

technical barriers to retrofitting equipment, to use alternative refrigerants and to collect and disseminate information on the latest overseas developments in non-CFC technology. Internet will provide a means of accessing this information and e-mail will provide an accessible avenue to receive ad hoc advice from technical experts in countries who have already completed a phase out program.

(h) Indo-Nepal Coordination Committee

The Government of Nepal will request the Government of India to establish an Indo-Nepal Coordination Committee on ODS Phase out. This Committee could consist of representatives of the Ozone Units of the two countries. It could meet as and when required to ensure that the ODS phase out actions in either of the two countries do not disturb the phase out process in the other country.

3.2.2 Projects

(a) Institutional strengthening

Implementation of the Country Programme will be coordinated through the Ozone Unit to be established in the NBSM. The unit will act as a focal point for the expeditious phase out of ODS. It will coordinate and monitor progress towards achieving the Action Plan and reduction of ODS. It will also undertake public awareness programmes and provide a focal point to advise government and guide industry to phase out ODS. A detailed project is attached.

(b) Refrigeration Management Plan

The Refrigeration Management Plan will identify gaps in skills, technical barriers and technical knowledge that need to be addressed to achieve a successful CFC phase out.

It is estimated that the bank of CFC in existing large equipment is about 100 tonnes, which should be adequate to supply the post phase out 'tail', provided it is properly managed. The RMP will identify means of conserving the current bank of CFC to supply the post phase out 'tail'.

3.3 Roles in implementing the strategy

The lead agency responsible for implementing the Montreal Protocol is the NBSM, Ministry of Industry. Implementation of this action plan will be achieved with the participation of the following government departments and NGOs:

- ◆ Customs Department
- ◆ Ministry of Industry
- ◆ Institute of Engineering
- ◆ Nepal Refrigeration and Air Conditioning Maintenance Association

3.4 Timetable and Consumption implications

It is expected that with an immediate ban on the import of CFC-containing equipment, the servicing need will fall by about 10% every year after 1999. As the recovery and recycling Programme for domestic refrigerators becomes operational, and as CFC price rises because of increased taxes, the need for CFC imports will fall. Following the control on CFC imports after 2003, the virgin CFC consumption would be regulated to ensure a reduction of about 30% per year, till complete phase out is achieved in 2010.

Figure 3.1 shows the expected phase out profile as a result of the Action Plan.

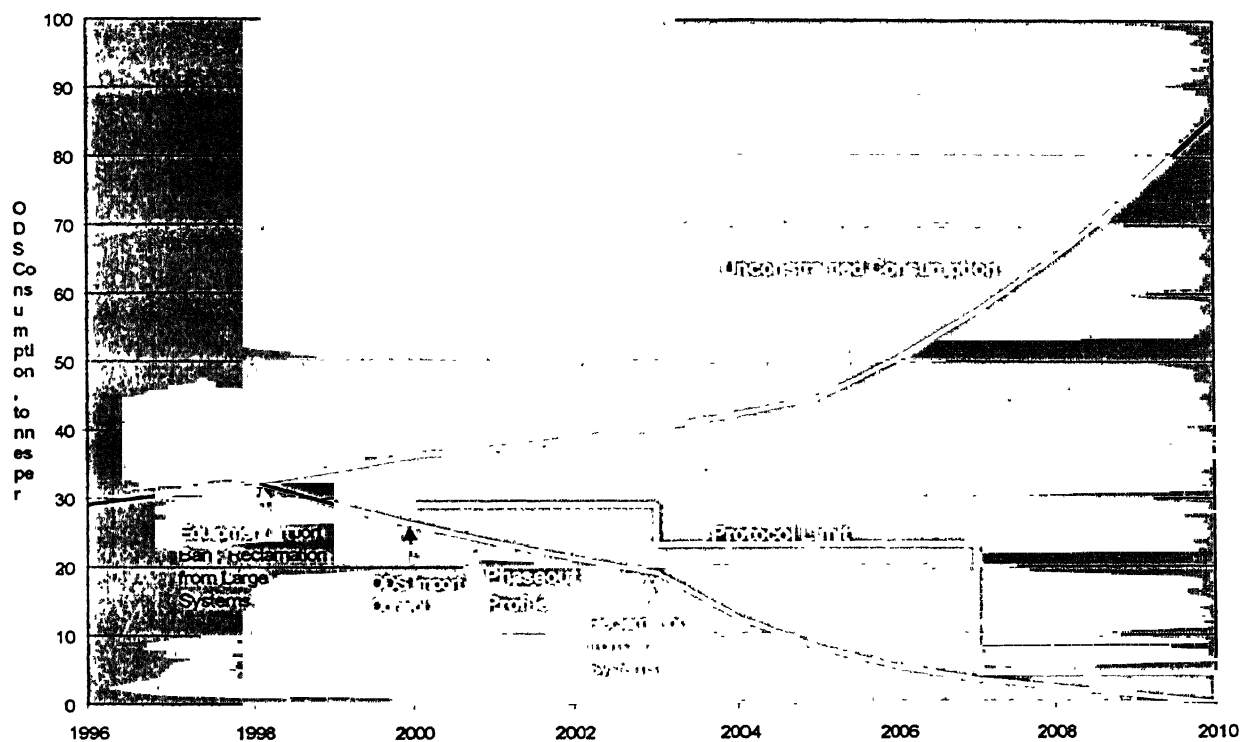


Figure 3.1 Expected phase out profile

3.5 Budget and Financial programme

The budget assumes that most of the action to effect a phase out of CFC, in line with this Country Programme, will occur in the first three years. The following projects are being submitted to seek assistance from the Multilateral Fund:

Project 1:

Industry Sector	All
Project	Institutional strengthening
Start Year	1998
Funding Assistance	US\$ 77,000

Project 2:

Industry Sector	Refrigeration and Air-conditioning
Project	Refrigerant Management Plan
Start Year	1998
Funding Assistance	US\$ 30,000

The following projects are being included for information purposes only and will be fully developed within the Refrigerant Management Plan.

Project 3:

Industry Sector	Refrigeration and Air conditioning
Project	Training Programme for refrigeration and air conditioning sector at the Nepal Institute of Engineering
Start Year	1999
Funding Assistance	US\$ 50,000

Project 4:

Industry Sector	Refrigeration and Air conditioning
Project	Establishment of recycling facilities
Start Year	1999
Funding Assistance	US\$ 150,000

Project 5:

Industry Sector	Refrigeration and Air conditioning
Project	Establishment of an import licensing system and training of custom officers
Start Year	1999
Funding Assistance	US\$ 40,000

Project 6:

Industry Sector	Refrigeration and Air conditioning
Project	Conversion of commercial refrigeration manufacturing enterprise
Start Year	1999
Funding Assistance	US\$ 20,000

3.6 Monitoring arrangements

Annual consumption will be monitored based on information collected by the Nepal Ozone Unit.

It will be the responsibility of the Ozone Unit to provide annual reports on ODS consumption as per the requirements of Article 7 of the Montreal Protocol and reports on project implementation to the relevant implementing agencies. The Ozone Unit will also report on progress of implementation of the Country Programme to the Multilateral Fund Secretariat, as per the decision of the 10th meeting of the Executive Committee of the Multilateral Fund.

Annex I : Projects

Project I

COUNTRY	:	Nepal
SECTORS COVERED	:	All
PROJECT TITLE	:	Institutional Strengthening
PROJECT DURATION	:	Three years
TOTAL BUDGET	:	US\$ 77,000
IMPLEMENTING AGENCY	:	UNEP
NATIONAL COORDINATING AGENCY	:	National Ozone Committee

Project Description

The project establishes a National Ozone Unit (NOU) within the Ministry of Industry, which will support co-ordinate and implement the Action Plan which addresses the reduction and phase out of ODS in Nepal. The NOU will provide the necessary institutional strengthening to ensure the coordination of projects, activities and development of a legislative framework.

The Action Plan in the Country Programme identifies a wide range of activities to be undertaken by agencies both within and outside government. There are also a large number of stakeholders that will be affected by the Action Plan.

The NOU will be administered by the lead agency, the Nepal Bureau of Standards & Metrology. It will provide secretarial support to the National Ozone Committee, which would consist of various governmental, industry and non-governmental agencies which deal with the handling and control of ODS. This Committee will bring together the major stakeholders to provide a strategic overview and act as a steering committee for the Programme.

The NOU will create the institutional framework and coordinate the day to day activities of the Action Plan. It will also monitor ODS consumption and report to UNEP on progress towards phase out of ODS in accordance with the Action Plan. It will ensure that the Government commitments to the Montreal Protocol are fulfilled. The Ozone Unit will also ensure that the activities of the Refrigeration and Air Conditioning Maintenance Association and Institute of Engineering are coordinated with the Action Plan.

It will act as the coordinator for the Action Plan and report to the Secretary, Ministry of Industry, who will also be chairman of the National Ozone Committee. The officer will also act as secretary to the National Ozone Committee and ensure that reports of the progress of implementation are prepared and distributed to members of the National Ozone Committee and relevant agencies.

For the successful implementation of the Country Programme, the following activities will be undertaken:

- formulate, implement and monitor the Refrigerant Management Plan and the associated projects
- prepare project proposals for policies, strategies, laws, regulations, incentives, agreements with the private sector
- implement other measures required for phase out of ODS
- act as a Secretariat for the National Ozone Committee on ODS
- coordinate and facilitate activities related to the phase out of ODS
- collect, collate, analyze and disseminate information on the ozone problem and related issues to relevant stakeholders

- support and manage public awareness campaigns, and prepare materials
- serve as a point of contact for the Multilateral Fund Secretariat, The Ozone Secretariat and co-implementing agencies
- monitor phase out projects and ODS consumption and report to the National Ozone Committee and UNEP
- give advise and support to industry, end users and relevant organizations on phase out options. Decide when additional technical expertise is required and help arrange for it to become available
- report annually to the Ozone Secretariat, UNEP in Nairobi-Kenya on the ODS consumption in the country according to Article 7 of the Montreal Protocol; and report annually to the Executive Committee of the Multilateral Fund on the progress in the implementation of the Country Programme, according to the decision taken by the Executive Committee of the Multilateral Fund at its 10th meeting.
- prepare project related reporting and submit to the corresponding implementing agency.

The main purpose of the establishment of the NOU is the efficient coordination of activities pertaining to fulfilling Nepal's obligations under the Montreal Protocol. The institutional strengthening provided by this project will ensure that the phase out of ODS is coordinated, cost effective and that all targets are met.

Due to competing demands on Nepal's limited resources and budgetary constraints, the necessary funds are being sought from the Multilateral Fund

Project Time Frame

The project commencement date is expected to be January 1999 and the completion date will be December 2001.

Project Budget

	Ist Year	IInd Year	IIIRD Year	Total (US\$)
2 Professionals	11,250	11,250	11,250	33,750
1 Secretary	2,250	2,250	2,250	6,750
Office equipment				6,500
- computer	2,000			
- fax	1,000			
- xerox	3,500			
Office & Maintenance	1,000	1,000	1,000	3,000
Travel	80,00	80,00	8,000	24,000
Information dissemination	1,000	1,000	1,000	3,000
Total				77,000

Project II

COUNTRY	:	Nepal
SECTORS COVERED	:	Industrial, Commercial and Domestic Refrigeration and Commercial Air Conditioning
ODS IN AFFECTED SECTORS	:	29 tonnes of annex A Group I ODS
PROJECT TITLE	:	Development of Refrigerant Management Plan
PROJECT DURATION	:	Three years
TOTAL BUDGET	:	US\$ 30,000
IMPLEMENTING AGENCY	:	UNEP
NATIONAL COORDINATING AGENCY	:	National Ozone Committee

Background

To develop a Refrigerant Management Plan (RMP), the following steps need to be followed:

- i) *Characterize the relative importance of sectors and sub-sectors on the basis of:*
 - Level of ODS consumption
 - Economic importance
 - Trade orientation
- ii) *Assess the available and feasible options, including:*
 - Technical options such as:
 - ◆ Emission reduction through good practices
 - ◆ Recovery and recycling
 - ◆ Conversion
 - Policy options such as:
 - ◆ Voluntary Programmes/Agreements
 - ◆ Legislation and Regulations
 - ◆ Economic Instruments.
- iii) *Evaluate the alternative options for:*
 - Cost-effectiveness
 - Feasibility
 - Maximum impact

On the basis of such a country-specific evaluation, the RMP will be developed. At the national level, it will usually be composed of the following elements:

1. inventory of ODS-using equipment, including assessment of inventory attributes, assessment of current refrigerant requirements, and determination of options and courses of action;
2. assessment of potential impact of public opinion and legislation regulation;
3. basic refrigerant management policy, including strategy, objectives, and approach.

Based on the previously mentioned assessments and the decided policy, an RMP may also contains some or all of the following elements:

1. specific plan for improving operations and maintenance practices (usually a nationwide Training Programme);
2. specific plan for establishing and enforcing refrigerant containment practices (usually a code of good practices, certification scheme, etc.);
3. specific plan for establishing and enforcing refrigerant recovery, recycling and reclamation;
4. specific plan for establishing and enforcing related policy for equipment procurement;
5. plan for establishment of supporting legislation regulation and awareness raising campaigns.

Objective

The main objective of the project is to develop the RMP which will comprise a comprehensive phase out strategy for the Refrigeration and Air-conditioning sectors. Implementation of the components of the RMP should be timed to complement one another to ensure maximum impact on ODS phase out in meeting country requirements.

Project Description

An international consultant together with national consultants with experience in (a) servicing and repairing commercial and industrial refrigerators and air conditioners, and (b) policy formulation and implementation, will be assigned to assist the Government in the development of the RMP. The consultants will cooperate closely with the National Ozone Unit and the other Implementing Agencies.

The consultants will closely follow the steps detailed above in Section 1 for the development of the RMP. The RMP should contain detailed plans for the implementation of some or all of the following elements:

- i) **Training** of Refrigeration technicians for improving operations, service and maintenance practices for emission control, and training of customs officers for improved monitoring practices;
- ii) **Recovery and Recycling** for establishing and enforcing refrigerant containment practices; This element will be developed in close consultation with other Implementing Agencies and/or Bilateral Agencies;
- iii) **Establishment of a System for Collection, Monitoring and Control of ODS data and related customs officers training**
- iv) **Policy Instruments** including organization and implementation of public awareness campaigns and activities.
- v) **Economic Instruments** including assessment, establishment and enactment of supporting legislation, enactment and implementation of regulations and economic incentives.

The RMP will also identify CFC-based equipment that requires retrofitting or replacement with systems based on alternative refrigerants, develop plans for large systems and strategies for generic classes or equipment, identify training needs and prepare a strategic plan for phase out in industrial, commercial and domestic refrigeration and commercial air conditioning sectors. The final RMP will be in the form of a project proposal to be submitted to Executive Committee for approval.

Project Monitoring

The Ozone Unit will have the responsibility for the overall monitoring of the development of the RMP and coordination with other Implementing Agencies. It will also have the responsibility for implementing the RMP, when approved by the Executive Committee.

Project Budget

International consultant (fees and travel)	US\$ 10,000
Local organization (consultants, travel)	US\$ 10,000
Technical assistance, monitoring and evaluation	US\$ 10,000
Total	US\$ 30,000